

WHAT IS CLAIMED IS:

1. A positive photosensitive resin composition comprising:

(A) a polymer which has alicyclic hydrocarbon skeletons and decomposes by the action of an acid to thereby become alkali-soluble,

(B) a compound which generates an acid upon irradiation with actinic rays,

(C) a nitrogen-containing basic compound, and

(D) at least one of a fluorine-containing surfactant and a silicon-containing surfactant.

2. A positive photosensitive resin composition comprising:

(A) a polymer which has bridged alicyclic hydrocarbon skeletons and decomposes by the action of an acid to thereby become alkali-soluble,

(B) a compound which generates an acid upon irradiation with actinic rays,

(C) a nitrogen-containing basic compound,

(D) a fluorine and/or silicon-containing surfactant, and

(E) a solvent;

wherein the ratio of (B) to (C) by weight is from 5 to 300 and the ratio of (A) to (D) by weight is from 500 to 20,000.

3. The positive photosensitive resin composition as described in claim 1, further comprising a low molecular acid-decomposable compound which has a molecular weight of 2,000 or below and a group capable of decomposing under the action of an acid to increase its solubility in alkali.

4. The positive photosensitive resin composition as described in claim 3, wherein the content of the low molecular acid-decomposable compound is from 0.5 to 20.0 parts by weight per 100 parts by weight of the total solids of the composition.

5. The positive photosensitive resin composition as described in claim 1, wherein the compound as Component (B) is an onium salt.

6. The positive photosensitive resin composition as described in claim 1, wherein the nitrogen-containing basic compound as Component (C) is an organic amine.

7. The positive photosensitive resin composition as described in claim 2, wherein the solvent as Component (E) comprises at least one solvent selected from the group consisting of ethyl lactate, propylene glycol monomethyl ether acetate, propylene glycol monomethyl ether, propylene glycol monomethyl ether propionate, methyl 3-methoxypropionate, ethyl 3-~~ethoxypropionate~~^{ethoxypropionate}, and 2-heptanone in an amount of at least 70 % by weight based on the total solvent.

8. The positive photosensitive resin composition as described in claim 1, wherein the actinic rays are deep ultraviolet rays having wavelengths of 220 nm or shorter.

9. A positive photosensitive resin composition comprising:

(A) a polymer which has alicyclic hydrocarbon skeletons and decomposes under the action of an acid to become alkali-soluble,

(B) a compound which generates an acid upon irradiation with actinic rays,

(C) a nitrogen-containing basic compound,

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(D) a fluorine and/or silicon-containing surfactant, and
(E) a solvent comprising as a first solvent at least one solvent selected from the following group (a) in an amount of 60 to 90 % by weight based on the total solvent and as a second solvent a solvent selected from the following group (b) in an amount of 10 to 40 % by weight to the total solvent; the group (a) consisting of ethyl lactate, propylene glycol monomethyl ether acetate, propylene glycol monomethyl ether propionate, methyl 3-methoxypropionate and ethyl 3-ethoxypropionate, and the group (b) consisting of solvents having a viscosity of not higher than 1 centipoise at 20°C.

10. The positive photosensitive resin composition as described in claim 9, wherein the solvent as Component (E) further comprises as a third solvent (c) a solvent having a boiling point of not lower than 180°C and a solubility parameter of at least 12 in an amount of 1 to 20 % by weight based on the total solvent.

11. The positive photosensitive resin composition as described in claim 10, wherein the third solvent (c) is at least one solvent selected from the group consisting of γ -butyrolactone, ethylene carbonate and propylene carbonate.

12. The positive photosensitive resin composition as described in claim 9, wherein the number of carbon atoms forming each of the alicyclic hydrocarbon skeletons present in the polymer as Component (A) is from 5 to 25.

13. The positive photosensitive resin composition as described in claim 9, wherein the nitrogen-containing basic compound as Component (C) is at least one compound selected from

the group consisting of organic amines, basic ammonium salts and basic sulfonium salts.

14. The positive photosensitive resin composition as described in claim 9, further comprising a low molecular acid-decomposable dissolution inhibitive compound which has a molecular weight of 2,000 or below and a group capable of decomposing under the action of an acid to increase its solubility in alkali.

15. The positive photosensitive resin composition as described in claim 9, wherein the actinic rays are deep ultraviolet rays having wavelengths of 220 nm or shorter.

16. A positive photosensitive resin composition comprising:

(A) a polymer ^{which} has alicyclic hydrocarbon skeletons and decomposes under the action of an acid to become alkali-soluble,

(B) a compound which generates an acid upon irradiation with actinic rays,

(C) a nitrogen-containing basic compound,

(D) at least one of a fluorine-containing surfactant and a silicon-containing surfactant, and

(E) a solvent comprising (a) ethyl lactate in an amount of 60 to 90 % by weight based on the total solvent and (b) ethyl 3-ethoxypropionate in an amount of 10 to 40 % by weight based on the total solvent.

17. The positive photosensitive resin composition as described in claim 16, wherein the solvent as Component (E) further comprises a solvent (c) having a boiling point of not lower than 180°C and a solubility parameter of at least 12 in

an amount of 1 to 20 % by weight based on the total solvent.

18. The positive photosensitive resin composition as described in claim 17, wherein the solvent (c) is at least one solvent selected from the group consisting of γ -butyrolactone, ethylene carbonate and propylene carbonate.

19. The positive photosensitive resin composition as described in claim 16, wherein the number of carbon atoms forming each of the alicyclic hydrocarbon skeletons present in the polymer as Component (A) is from 5 to 25.

20. The positive photosensitive resin composition as described in claim 16, wherein the nitrogen-containing basic compound as Component (C) is at least one compound selected from the group consisting of organic amines, basic ammonium salts and basic sulfonium salts.

21. The positive photosensitive resin composition as described in claim 16, further comprising a low molecular acid-decomposable dissolution inhibitive compound which has a molecular weight of 2,000 or below and a group capable of decomposing under the action of an acid to increase its solubility in alkali.

22. The positive photosensitive resin composition as described in claim 16, wherein the actinic rays are deep ultraviolet rays having wavelengths of 220 nm or shorter.

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